Corso Residenziale SIO

Gestione Terapeutica del Paziente Obeso

Tecniche Chirurgiche Risultati e Problemi

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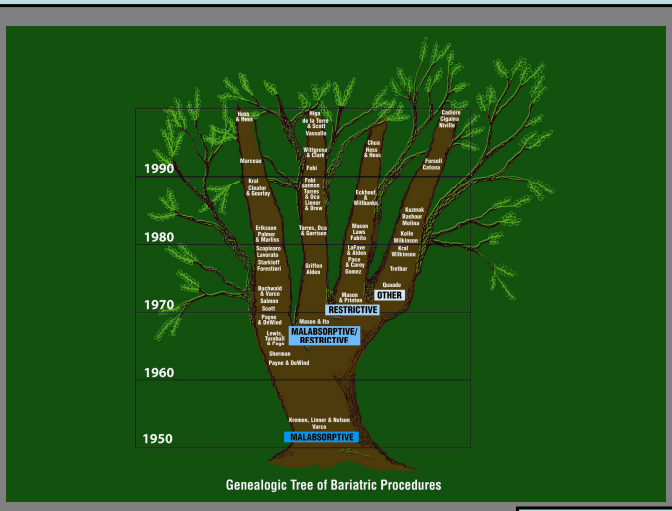
Director: Giuliano Enzi
Padova Italy

Verona, 25-26 Gennaio 2008

EVOLUTION OF BARIATRIC SURGERY

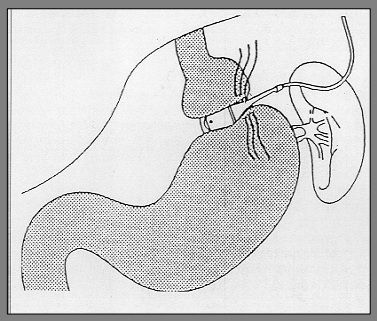


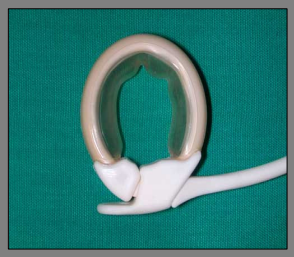
Henry Buchwald
Minneapolis, Minnesota

Opzioni in chirurgia bariatrica

- Interventi Restrittivi
  - Gastroplastica Verticale
  - Bendaggio Gastrico
- Interventi Restrittivi-Malassorbitivi
  - Bypass Gastrico
  - Diversione Biliopancreatica

LAP-BAND™ System



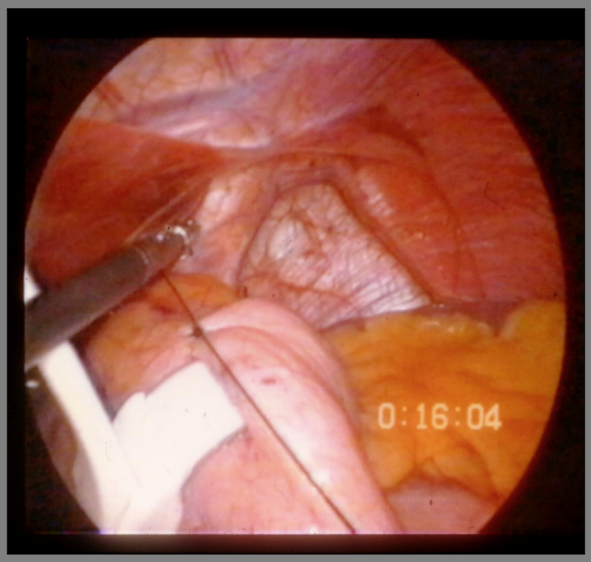


Lap Band: Key points

Embedment of the Band
(retention sutures)

Standardized from Pat.n.3 (Nov '93)

Lap Band: Key points

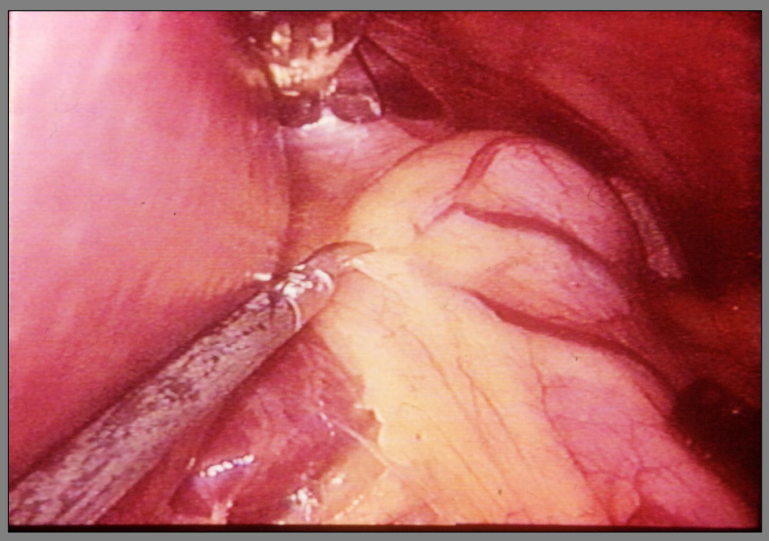


Lap Band: Key points

Reference points for dissection
(equator of the balloon: left crus)

Standardized from Pat.n.13 (Sept. '94)

Lap Band: Key points



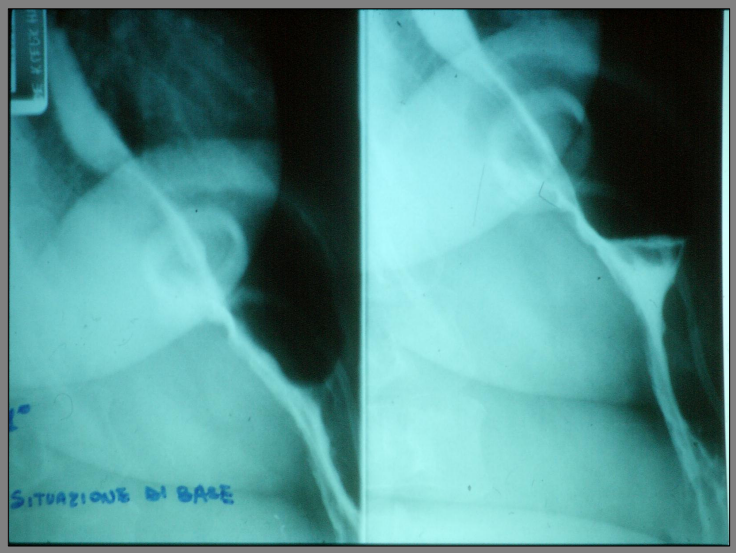
Lap Band: Key points

Virtual pouch

(based on a 25 ml measurement)

Standardized from Pat.n.27 (Feb.'95)

Lap Band: Key points

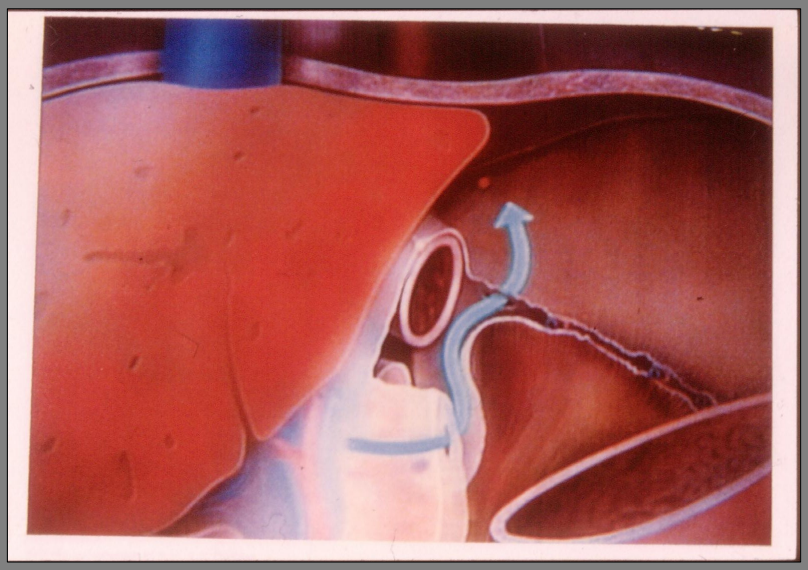


Lap Band: Key points

Retrogastric tunnel above the peritoneal reflection of bursa omentalis

Standardized from Pat.n.48 (May.'95)

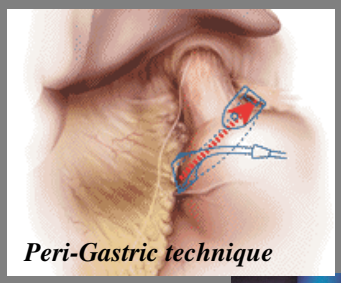
Lap Band: Key points

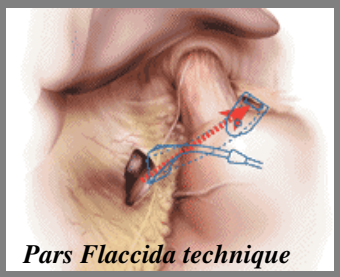


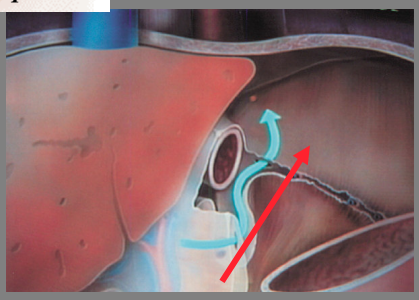
Modification of the technique

Initial Approach	Current Approach
3cm below EG	1cm below EG
Greater curve dissection 1st short gastric	Greater curve dissection at Angle of His
Lesser curve dissection: ***perigastric***	Lesser curve dissection: ***pars flaccida***
Gastrostenometer to determine initial inflation	Not used, band left empty
Gastric pouch 25-30cc	"Virtual" pouch just below EG

Change in technique to prevent posterior slippages







Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

Our Series

(Septembre 1993/ December 2005)

1791 Patients

(F/M 1345/446)

Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

1791 Patients

Mortality 0

Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

1791 Patients

Follow up Rate (12 Years): 91.6 %

Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

1791 Patients
Follow up Rate (12 Years): 91.6 %

YEAR	N. of Operations	Total	FollowUp Years	N. Pts FollowUp	Follow-Up Rate
1993	4	4	12	4	100%
1994	18	22	11	22	100%
1995	59	81	10	74	91.3%
1996	129	210	9	188	89.5%
1997	130	340	8	311	91.4%
1998	143	483	7	415	85.9%
1999	168	651	6	588	90.3%
2000	192	843	5	765	90.7%
2001	133	976	4	895	91.7%
2002	143	1119	3	1001	89.4%
2003	201	1320	2	1198	90.7%
2004	198	1518	1	1353	89.1%
2005	273	1791	-	-	-
Mean FollowUp Rate					***91.6%***

Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

Patient Characteristics

- *75% Female, 24.9% Male*
- *Mean Age: 38.7 Years*
- *Mean Body Weight: 127.7 ± 24 kg*
- *Mean BMI: 46.2 ± 7.7*
- *Baseline Co-Morbidities: 71% of Patients*

Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

Baseline co-morbidities

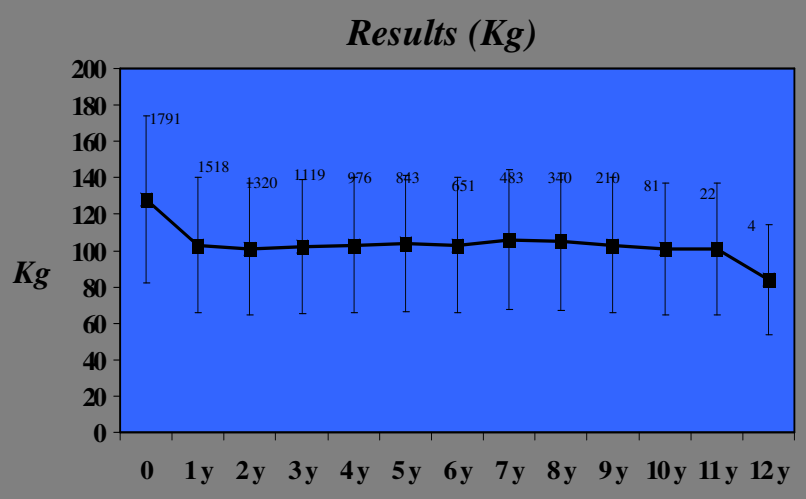
Co-morbidities	%
Hypertension	35.6
Type II Diabetes	22.0
Dislypidemia	27.1
Hyperuricemia	9.3
OSAS	31.4
Hearth Failure	1.4
Osteoarthritis	57.8
Amenorrea	4.9
Gallbladder	8.7
Depression	21.2
Sweet eating	22.5
Binge eating	18.5

Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

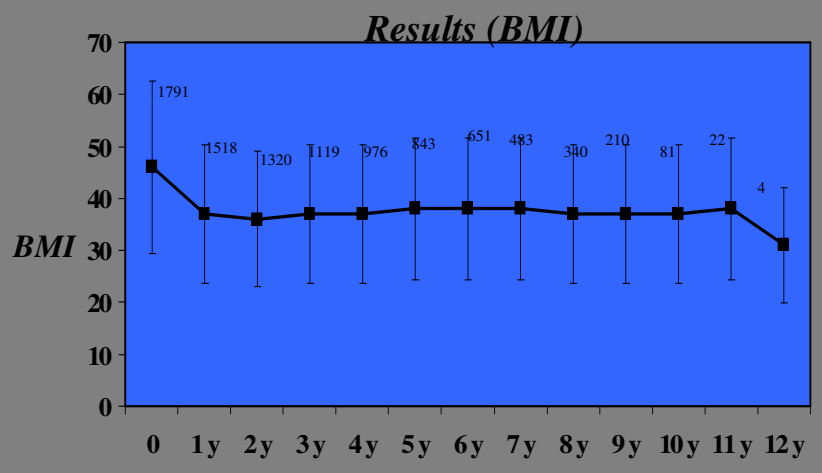
Methods

- ***Dissection***
  - *77.8% Perigastric*
  - *21.5% Pars Flaccida*
  - *0.8% Combined Approach*
- ***11.9% Simultaneous Procedures Performed***
  - *2.4% Hiatal Hernia Repair*
  - *7.8% Cholecystectomy*
  - *1.7% Other Procedure*

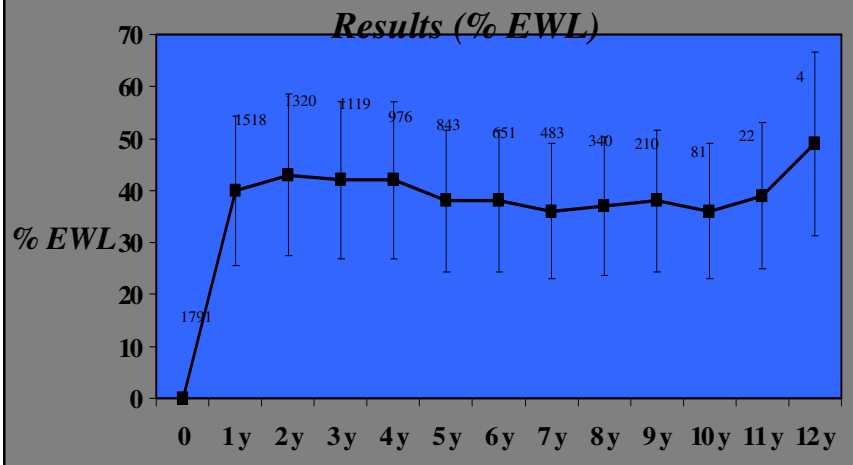
Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results



Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

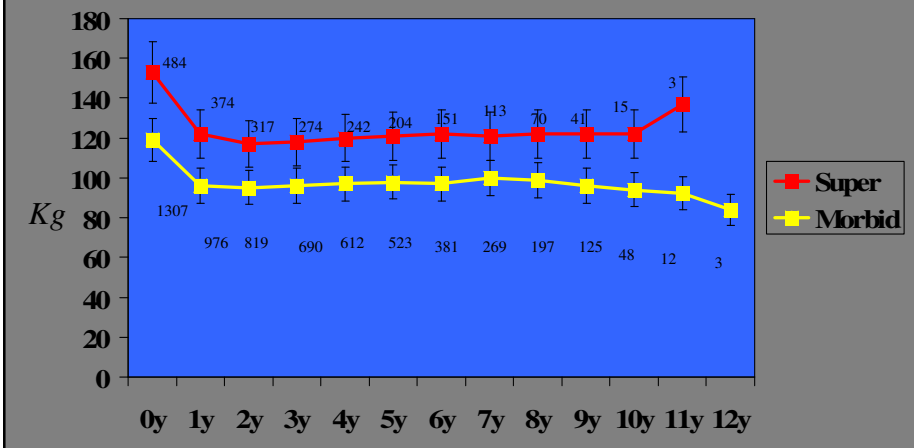


Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results



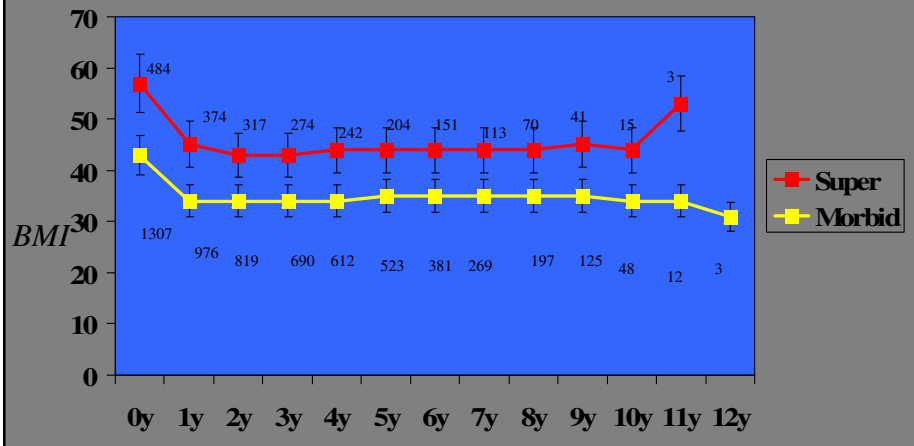
Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

Results in Super e Morbid Obese (BMI)



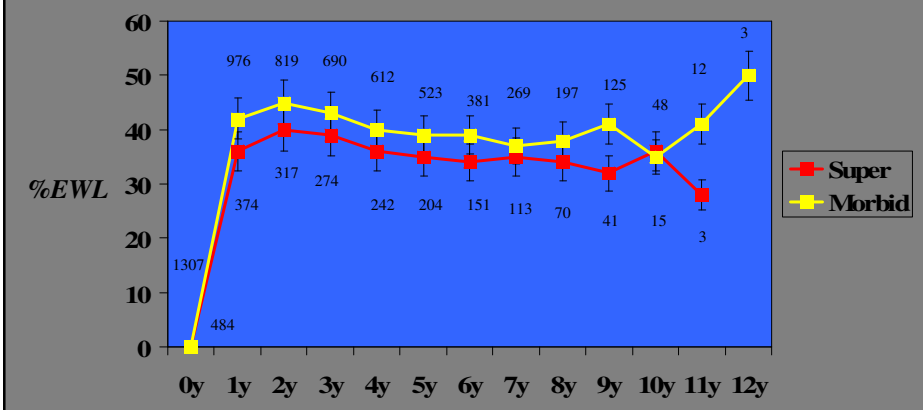
Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

Results in Super e Morbid Obese (BMI)

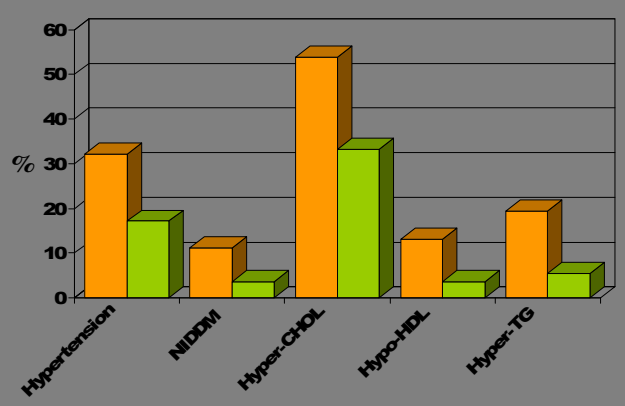


Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

Results in Super e Morbid Obese (% EWL)

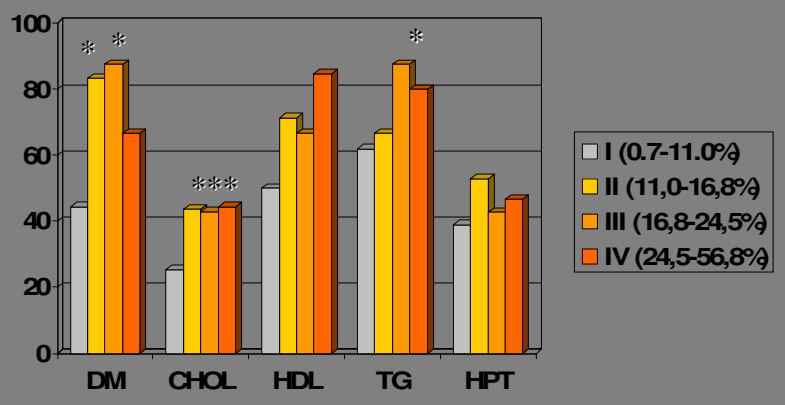


Prevalence of metabolic abnormalities in 650 morbid obese patients before and 1 year after LAP-BAND™.



Busetto, Enzi et al.

Percent of patients with diabetes, dyslipidaemia or hypertension at baseline with normalisation 1 year after LAP-BAND™, according to quartiles of % Weight Loss.



Busetto, Enzi et al.

Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

Major Complications Requiring Reoperation (106/1791 pts.; Sept 1993-Dec 2005)

Complications	Number	Rate of Complications	Reoperation	Number	Rate of Reoperation
Stomach Slippage + Pouch Dilatation	*70*	*3.9%*	• *Removal* • *Repositioning*	*20* *50*	*1.1%* *2.8%*
Erosion	*16*	*0.9%*	*Removal*	*16*	*0.9%*
Psychological Intolerance	*14*	*0.7%*	*Removal*	*14*	*0.7%*
Miscellaneous (HIV, Infections, Microperforation)	5	0.27%	Removal	5	0.27%
Gastric Necrosis	1	0.05%	Gastrectomy	1	0.05%
Total	***106***	***5.9%***	***Total***	***106***	***5.9%***
Unsatisfactory Results (Lack of Compliance)	*41*	*2.3%*	• *BPD* • *Removal* • *"BandInaro"*	*5* *12* *24*	*0.27%* *0.7%* *1.3%*

Laparoscopic Gastric Banding for 1800 Patients: 12 Years Results

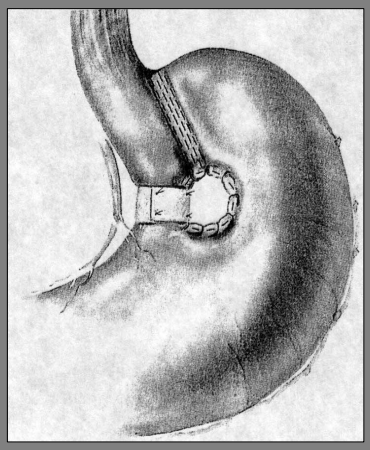
Minor Complications Requiring Reoperation (106/1791 pts.; Sept 1993-Dec 2005)

11.2% Port Reoperation – 200 patients

LAP BAND™

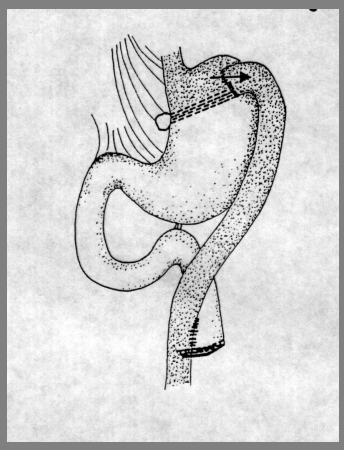
- Low rate of complication (experienced advanced laparoscopic surgeon)
- Good weight loss stable in time
- Importance of follow-up
- First choice operation

Gastroplastica Verticale



- Vomito frequente
- Esofagite
- Erosione – Stenosi Stoma
- Deiscenza sutura gastrica
- Fistola gastro-gastrica
- Recupero ponderale

Bypass Gastrico



- Esofagite
- Dumping Syndrome
- Deficit di ferro
- Vit B12,A,D,E, acido folico
- Ulcera peptica
- Occlusione dell'Outlet
- Occlusione intestinale

1994

Wittgrove and Clark

GIB: Laparoscopic Roux GIB

"distal GBP"

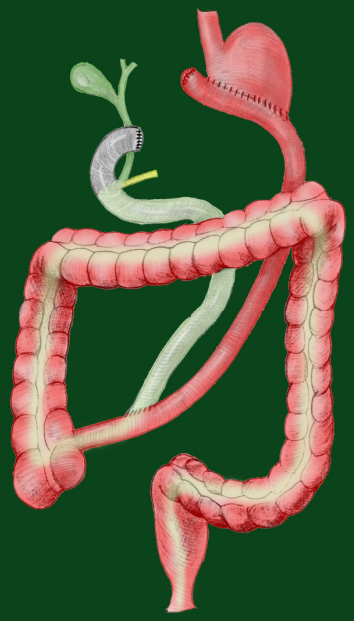
"extended GBP"

"long-limb GBP"

"other GBP procedures"

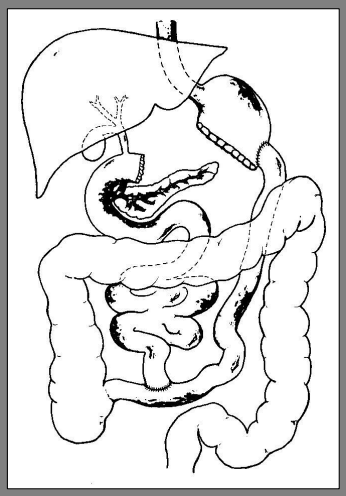
1979

Scopinaro



Biliopancreatic bypass

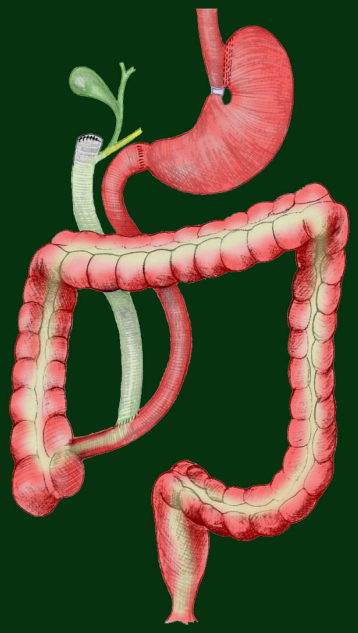
Diversione Biliopancreatica



- Ulcera dello Stoma
- Occlusione Intestinale
- Pancreatite acuta
- Diarrea - Steatorrea
- Anemia sideropenica
- Neuropatia
- Encefalopatia Wernicke
- Malnutrizione proteica
- Demineralizzazione

1997

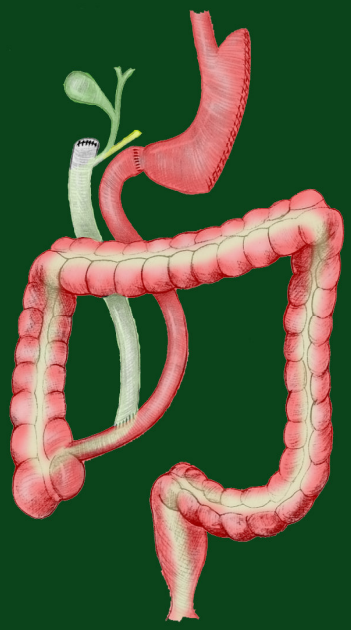
Vassallo



Biliopancreatic bypass
with transient VBG

1998

Hess and Hess

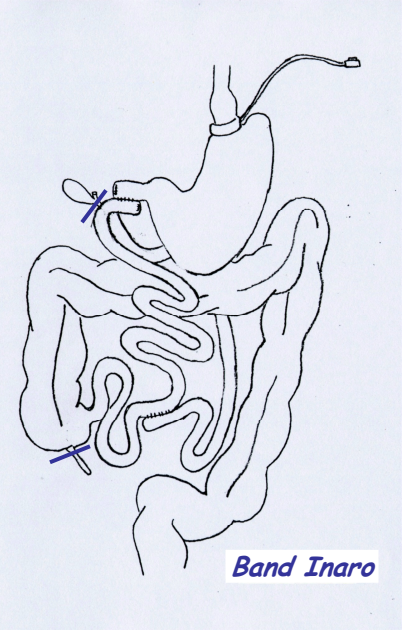


Duodenal switch with
division of the duodenum

Lap Band + Scopinaro

Band-Inaro

- Digestive loop = 200 cm.
- Common loop = 50 cm
- Bilio-pancreatic loop = remainder of small intestine



Valutazione delle opzioni
Complicanze chirugiche tardive

- **LAP-BAND** :
  - Erosione (0.5%)
  - Dilatazione Tasca/Scivolamento (2.8 %)
- **BYPASS GASTRICO :**
  - Occlusione Outlet (Funzionale 7.6% o Anatomica 3.4%)
  - Ulcera peptica (1-25%)
  - Occlusione del piccolo intestino (4.7%)
- **DIVERSIONE BILIOPANCREATICA :**
  - Ulcera dello Stoma (3.2%)
  - Occlusione Intestinale (1%)

Valutazione delle opzioni
Complicanze nutrizionali

- **LAP-BAND** :
  - Vomito e Intolleranza al cibo solido.
- **BYPASS GASTRICO :**
  - Vomito, Dumping Syndrome, Diarrea, Ipoglicemia.
  - Deficit di ferro, Vitamine B12-A-D-E, Acido Folico.
- **DIVERSIONE BILIOPANCREATICA :**
  - Vomito, Diarrea, Steatorrea.
  - Anemia da deficit di ferro.
  - Deficit vitaminici gravi (Neuropatia - Wernicke).
  - Malnutrizione Proteica (15.1% ⇒ 3.0%).
  - Demineralizzazione ossea.

Weight Loss and Risk Score in Lap Band (LAGB), Vertical Banded Gastroplasty (VBG) and Roux-en-Y Gastric Bypass (RYGB): A Systematic Literature Review.

(*64 studies LAGB; 57 studies comparative procedure)*

	N. of patients	Mortality rate	Morbidity rate	% Excess Weight Loss	
				0-2 years	2-4 years
LAGB	5780	0.05%	11.3%	↑ ↑	↑ ↑
VBG	2858	0.31%	25.7%	↑ ↑ ↑	↑ ↑
RYGB	9258	0.50%	23.6%	↑ ↑ ↑	↑ ↑

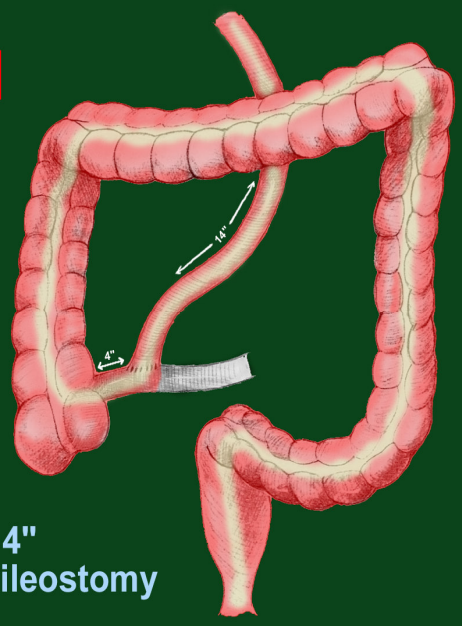
Chapman AE
Laparoscopic Adjustable Gastric Banding in the Treatment of Obesity: A Systematic Literature Review
Surgery 135; 326-351, 2004

Tecniche Chirurgiche
Risultati e Problemi

Quali altri Interventi?

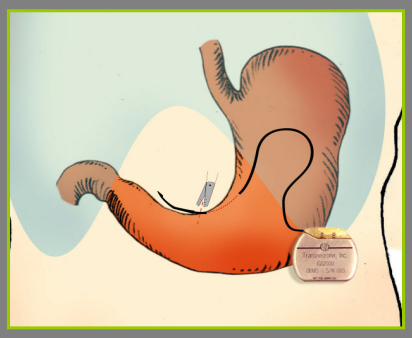
1969

Payne and DeWind

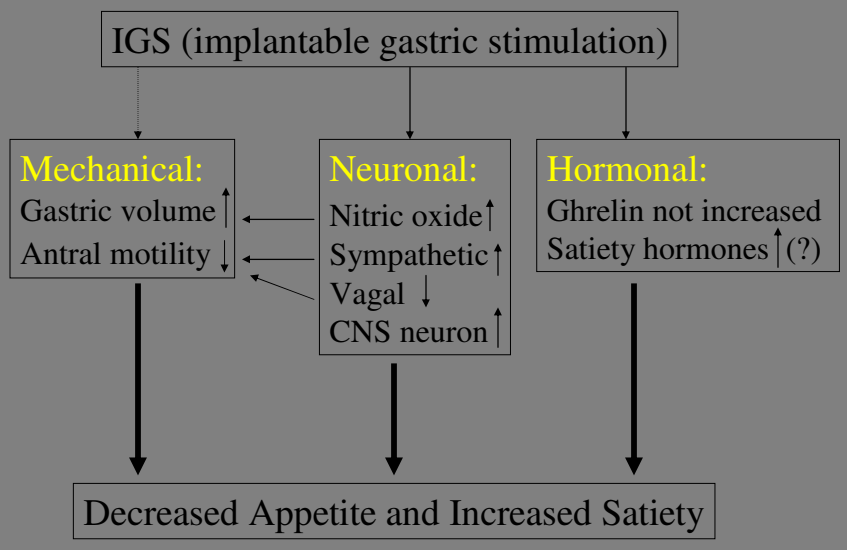


JIB: Classic 14" + 4"
end-to-side jejunoileostomy

Implantable Gastric Stimulation



Mechanisms of Action



SHAPE XL

Screened Health Assessment & Pacer Evaluation

- 8 Sites in US and one in Europe (Vicenza- Italy)
- Randomized, placebo-controlled, double-blind multicenter study

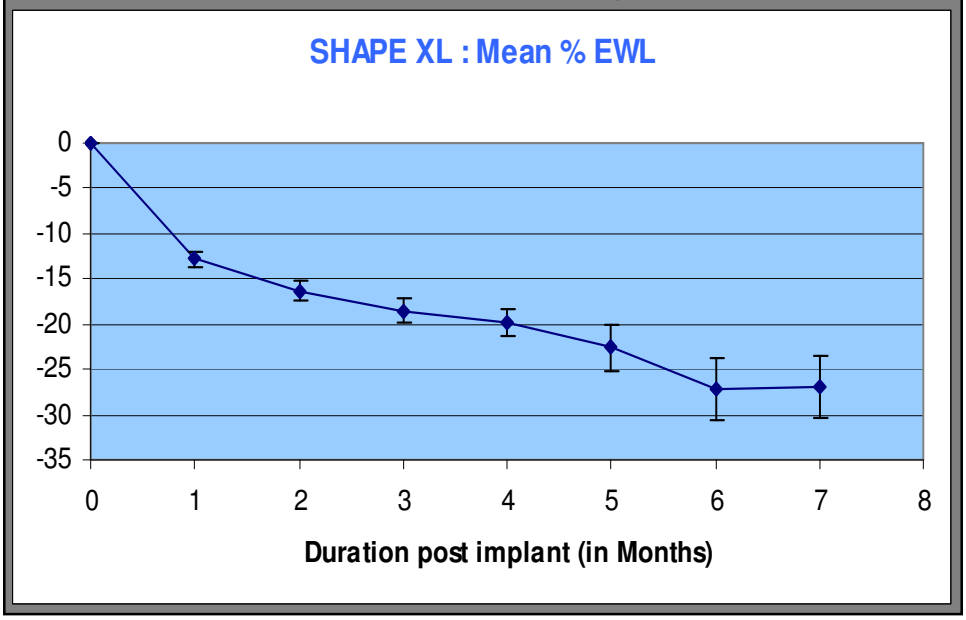
SHAPE
Demographic Data
Regional Hospital of Vicenza

- Screened 170 patients
- 30 patients implanted (31/Jan thru 29/Apr/05)
- 22 Females
- Mean Age:43.7 (22-58) years
- Mean BMI : 41.5 (35.7 – 49.7) kgm2
- Mean Weight : 116.8 (91.3-146.0) kg
- Mean Excess Weight :53.5 (33.2-79.9) kg

SHAPE
Study Methods

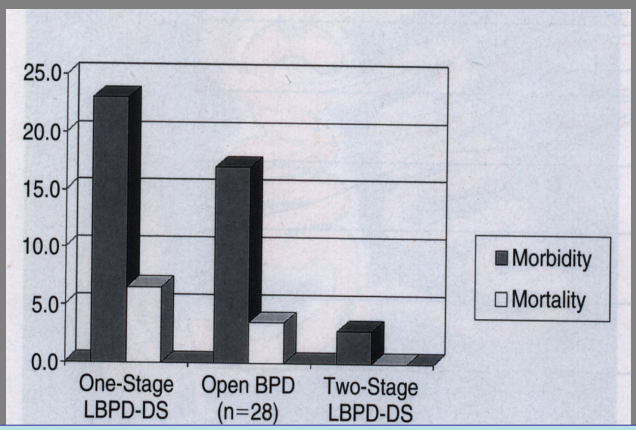
- Monthly follow-up for the first 24 months
- Blinding period : 12 months (15 patients with IGS ON and 15 Patients with IGS OFF)
- After 12 months all patients will have the IGS activated
- Monthly support group meeting
- Diet of negative 500 Kcal daily plus physical activity
- Monitoring for Adverse Events and Concomitant Medications

SHAPE
Results at Month 7 Weight Loss



Gagner Series

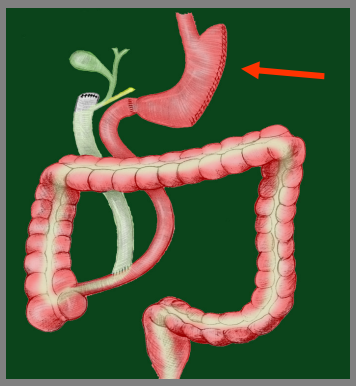
Morbidity and mortality percentages according to open BPD-DS, Laparoscopic BPD-DS, and Two Stage Laparoscopic BPD-DS



Gagner M, Inabnet W B, Pomp A
Laparoscopic Sleeve Gastrectomy with Second Stage Biliopancreatic Diversion and Duodenal Switch in the Super Obese
Laparoscopic Bariatric Surgery. Lippincot Williams & Wilkins 2004

Sleeve Gastrectomy

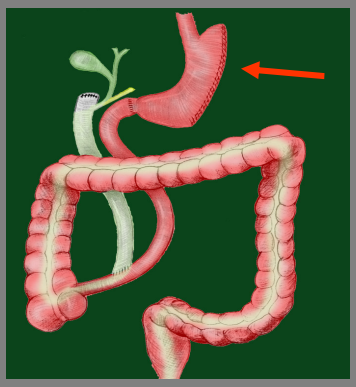
A restrictive procedure in absence of a silastic ring or in absence of a Band ?



Sleeve Gastrectomy

Weight Loss due to:

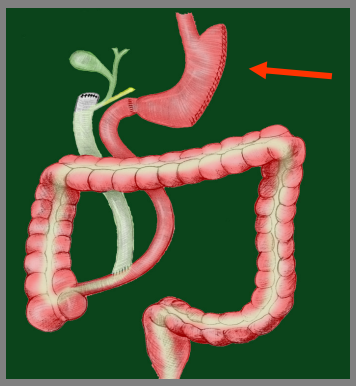
- ***Gastric restriction***
- ***Neurohumoral changes***



ASMBS *(American Society for Metabolic & Bariatric Surgery*
Executive Council June 17, 2007

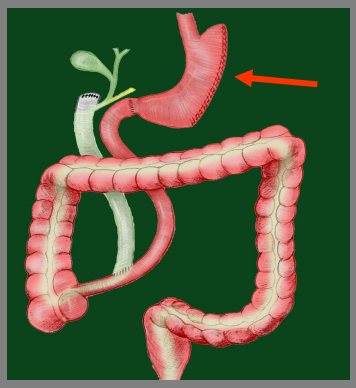
Sleeve Gastrectomy

- *15 published Reports*
- *A single study provides data up to 3 years*
- *EWL ranging from 33% to 83%*
- *Major complication ranging from 0% to 24%*



ASMBS *(American Society for Metabolic & Bariatric Surgery*
Executive Council June 17, 2007

Sleeve Gastrectomy

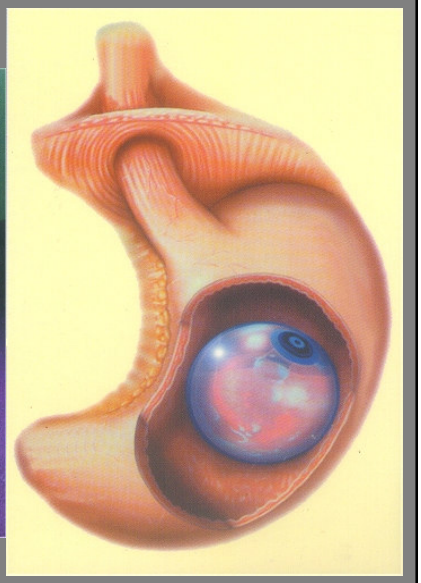


Position Statements:

- ***Selected Patients (High risk and Super-Super Obesity)***
- ***Staged Bariatric Surgery***
- ***Lack of Published Evidence beyond 3 years***

ASMBS *(American Society for Metabolic & Bariatric Surgery*
Executive Council June 17, 2007

Intragastric Balloon



BIB Series

1040 Pts (Jan 1999 – June 2007)

		Male	Female
N of Patients	**1040**	**438**	**702**
Height (m)	**1.64 ± 0.6**	**1.78 ± 0.4**	**1.63 ± 0.1**
Weight (Kg)	**134.8 ± 38.1**	**143.7 ± 22.6**	**131.4 ± 34.0**
BMI	**48.0 ± 11.6**	**51.7 ± 4.9**	**45.2 ± 4.7**

Indications for BIB treatment - total series of 1040 patients:

- *BIB pre Lap Band 308 pts (32.8%)*
- *BIB Test 197 pts (21.1%)*
- *BIB solo 349 pts. (37.3%)*
- *BIB high comorbidities 55 pts (5.9%)*
- *BIB post Lap Band 26 pts (2.8%)*

BIB Series

1040 Pts (Jan 1999 – June 2007)

Results – Weight Loss

N. of Patients	*Weight (Kg)*	*BMI*	*% EWL*
1040	*115.5 ± 27.4*	*41.0 ± 6.2*	*32.3 ± 18.5*

BIB Series

1040 Pts (Jan 1999 – June 2007)

Results – Comorbidities

COMORBIDITIES PRE-BIB		BIB REMOVAL-RESULTS	
		DRUG REDUCTION	DRUG ELIMINATION
Type II Diabetes	23 pts	9 (47%)	5 (26%)
Hypertension	27 pts	17 (63%)	7 (26%)
Post heart attack	2 pts	2 (100%)	-
Sleep apnea (CPAP)	14 pts	4 (28%)	8 (57%)
Arthrosis	26 pts	9 (35%)	4 (15%)
Depression	9 pts	3 (33%)	-
Post traumatic spinal cord injury	2 pts	-	-

BIB Series

1040 Pts (Jan 1999 – June 2007)

Complication

- *Intolerance/ vomiting with removal 46 cases (4.4%)*
- *Severe Gastric Dilation with removal 11 cases (1.0%)*
- *BIB deflation with removal 8 cases (0.8%)*
- *BIB deflation with replacementl 1 case (0.1%)*
- *BIB deflation and elimination by stool 1 case (0.1%)*
- *No small bowel obstruction (0%)*
- *BIB dilation with removal 1 case (0.1%)*
- *Severe esophagitis at removal 2 cases (0.2%)*
- *Sopra Ventricular Fibrillation 1 case (0.1%)*
- *Kidney Cancer 1 case (0.1%)*
- *Allergy 1 case (0.1%)*
- *Gastric bleeding 2 cases (0.2%)*
- *Pressure ulcer of the gastric antrum 1 case (0-1%)*
- *Fatal pulmonary embolism 2 cases (0.2%).*
- *Fatal Hearth attack in pt with cardiophaty 1 case (0.1%)*

Intragastric Balloon

"Pre-operative weight loss by intragastric balloon in super obese patients treated with laparoscopic gastric banding: a Case-Control study"

Busetto L, Segato G, De Luca M, Bortolozzi E, Maccari T, Magon A, Favretti F, Enzi G

Obesity Surgery, 14, 671-676, 2004

Patients selection in Case-Control study

Jan 1999 – April 2003:

90 super obese patients with indication to BIB + LAPBAND

↓

43 super obese patients completed BIB + LAPBAND

↓

43 CASE PATIENTS

↔

Sept 1993 – Dec 1998:

483 patients treated with LAPBAND alone

↓

43 super obese patients matched for sex, age, BMI

↓

43 CONTROL PATIENTS

Anthropometric data in Case-Control study

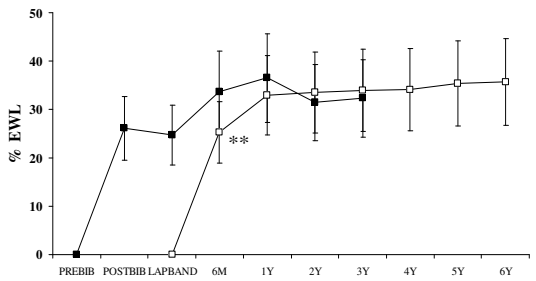
	BIB-LAPBAND (case pts)	LAPBAND (control pts)
N:	43	43
Age	43.3±10.5	42.8±10.5
Height	1.71±0.10	1.69±0.10
Weight	171.0±25.4	163.4±22.7
BMI	58.4±6.6	56.9±5.7

Operative data in Case-Control study

	BIB-LAPBAND (case pts)	LAPBAND (control pts)
Op time	82.5±20.9	102.6±35.1 *
H stay	3.0±0.2	3.3±0.8 *
Conversion	0/43 (0%)	7/43 (16.3%) *
IO Compl	0/43 (0%)	3/43 (7.0%)

Busetto L, Segato G, De Luca M, Bortolozzi E, Maccari T, Magon A, Favretti F, Enzi G
PreOperative Weight Loss by Intragastric Balloon in Super Obese Patients
Treated with Laparoscopic Gastric Banding: A Case Control Study
Obesity Surgery, 14, 671-676, 2004

Weight loss in Case-Control study



N. BIBPRE	43	43	43	37	18	13	6			
N. LAPBAND	--	--	43	43	41	39	35	32	28	15

Busetto L, Segato G, De Luca M, Bortolozzi E, Maccari T, Magon A, Favretti F, Enzi G
PreOperative Weight Loss by Intragastric Balloon in Super Obese Patients Treated with Laparoscopic Gastric Banding: A Case Control Study
Obesity Surgery, 14, 671-676, 2004

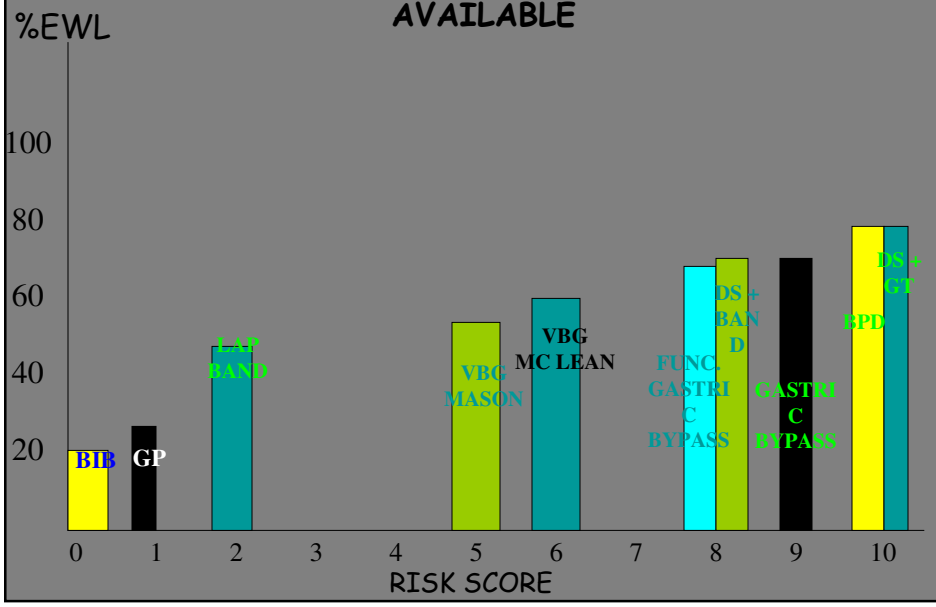
EFFECTIVENESS (% EWL) OF THE VARIOUS SURGICAL TECHNIQUES CURRENTLY AVAILABLE

OPERATION	% EWL
Intragastric Balloon (BIB)	20
Gastric Pacing	25
Lap-Band	50
Vertical Banded Gastroplasty (Mason)	55
Vertical Banded Gastroplasty (Mc Lean)	60
“Functional” Gastric By-pass	70
Duodenal switch + Lap-Band (Band inaro)	75
Gastric By-pass	75
Bilio Pancreatic Diversion	80
Duodenal Switch + Gastric Tubulisation	80

RISK SCORE OF THE VARIOUS SURGICAL TECHNIQUES CURRENTLY AVAILABLE

OPERATION	General Anesthesia	Invasiveness Opening G.I. Tract	Anatomical Reversibility	Functional Reversibility	Morb	Risk Score
Intragastric Balloon (BIB)	0	0	0	-	0	0
Gastric Pacing	1	0	0	-	0	1
Lap-Band	1	0	0	-	1	2
Vertical Banded Gastroplasty (Mason)	1	1	-	1	2	5
Vertical Banded Gastroplasty (Mc Lean)	1	2	-	1	2	6
"Functional" Gastric By-pass	1	3	-	1	3	8
Duodenal Switch + Lap Band (Band inaro)	1	3	-	1	3	8
Gastric By pass	1	3	-	1	4	9
Bilio Pancreatic Diversion	1	4	-	1	4	10
Duodenal switch + Gastric Tubulisation	1	4	-	1	4	10

EFFECTIVENESS (%EWL) AND RISK SCORE OF THE VARIOUS SURGICAL TECHNIQUES CURRENTLY AVAILABLE



Chirugia Bariatria : gold standards

- Selezione multidisciplinare dei pazienti (chirurgo, obesiologo, psicologo, ...).
- Team chirurgico con esperienza in più di una tecnica operatoria.
- Supporto nutrizionale post-operatorio.
- Follow up multidisciplinare routinario.
- Committment al follow up a lungo termine.
- Trattamento rapido delle complicanze.

Bariatric Surgery

Future characterized by:

- Major impact of Quality of Life and Risk/Benefits Analyses Concepts
- Step by Step approach/Sequential Therapy of Obesity